



January 2017

# MILITARY BASE REALIGNMENTS AND CLOSURES

DOD Has Improved  
Environmental  
Cleanup Reporting  
but Should Obtain and  
Share More  
Information

# GAO Highlights

Highlights of [GAO-17-151](#), a report to congressional committees

## Why GAO Did This Study

The environmental cleanup of bases closed under the BRAC process has historically been an impediment to the expeditious transfer of unneeded property to other federal and nonfederal parties. While DOD is obligated to ensure that former installation property is cleaned up to a level that is protective of human health and the environment, the cleanup process can delay redevelopment in communities affected by the BRAC process.

The House Report accompanying the fiscal year 2016 Military Construction, Veterans Affairs, and Related Agencies Appropriations Bill includes a provision for GAO to update its 2007 report on the environmental cleanup and transfer of installations closed under BRAC. This report addresses the extent to which DOD has made progress in: (1) capturing and reporting environmental cleanup costs at installations closed under BRAC and (2) transferring excess property and mitigating any challenges. GAO reviewed DOD guidance, cost data, and property transfer data; visited installations selected from among those with the highest cleanup costs, as well as other factors; and interviewed DOD and service officials.

## What GAO Recommends

GAO recommends that (1) DOD include in future reports to Congress that the cleanup of emerging contaminants will increase cleanup costs, and estimate such costs, and (2) share best practices on mitigating cleanup and property transfer challenges. DOD concurred with GAO's recommendations.

View [GAO-17-151](#). For more information, contact Brian Lepore at (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov).

January 2017

## MILITARY BASE REALIGNMENTS AND CLOSURES

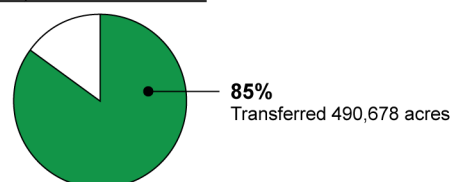
### DOD Has Improved Environmental Cleanup Reporting but Should Obtain and Share More Information

## What GAO Found

The Department of Defense (DOD) has captured and reported more comprehensive cost information in its environmental cost reporting for installations closed under the Base Realignment and Closure (BRAC) process since GAO last reported on the issue in 2007. For example, GAO reported in 2007 that the costs DOD reported for environmental cleanup for installations closed under the 2005 BRAC round were not complete; however, since fiscal year 2009, DOD's annual reports to Congress on environmental cleanup have included cleanup costs for all identified munitions and contaminants. For example, DOD estimated as of September 30, 2015, that it will need about \$3.4 billion to complete environmental cleanup for installations closed under all BRAC rounds, in addition to the approximately \$11.5 billion it has already spent. Despite this improvement in reporting, DOD has not reported to Congress in its annual report that the removal of certain emerging contaminants (i.e., contaminants that have a reasonable possible pathway to enter the environment, present a potential unacceptable human health or environmental risk, and do not have regulatory standards based on peer-reviewed science) will be significant. Without DOD including in its annual report to Congress its best estimate of these increased costs, Congress will not have visibility into the significant costs and efforts associated with the cleanup of emerging contaminants on BRAC installations and therefore will not have the necessary information to make more informed funding decisions.

DOD has used a variety of methods since GAO's 2007 report to continue to make progress in transfers of unneeded BRAC property. For example, as of September 30, 2015, DOD reported that it had transferred about 85 percent of its unneeded property identified in all BRAC rounds (see figure below). Despite this progress, installation officials stated that they continue to face challenges, such as navigating multiple regulatory agencies or disposing of radiological contamination, that increased the time it takes to clean up and transfer property. Installation officials GAO spoke with stated that they periodically reach out to officials at other installations, and across services, for help in learning how to expedite or resolve challenges, but there is no formal mechanism within DOD to capture and share this type of information. Installation officials further stated that a system to capture lessons learned would assist them in this effort. Without a mechanism to record and share lessons learned, installation personnel charged with implementing cleanup efforts are missing opportunities to share information and could duplicate errors made in the past.

**Disposition of Unneeded BRAC Acreage, as of September 30, 2015**  
575,758 unneeded acres



Source: GAO analysis of Department of Defense data. | GAO-17-151

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## Abbreviations

BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DOD	Department of Defense
OSD	Office of the Secretary of Defense
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate

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January 19, 2017

Chairman  
Ranking Member  
Subcommittee on Military Construction, Veterans Affairs, and Related  
Agencies  
Committee on Appropriations  
United States Senate

Chairman  
Ranking Member  
Subcommittee on Military Construction, Veterans Affairs, and Related  
Agencies  
Committee on Appropriations  
House of Representatives

The cleanup of environmental contaminants, such as hazardous substances or unexploded ordnance,<sup>1</sup> found on military installations closed under the Base Realignment and Closure (BRAC) process has cost billions of dollars and has historically been a key impediment to the expeditious transfer of unneeded property to other federal and nonfederal parties that can make new uses of the property. While the Department of Defense (DOD) is obligated to ensure that former installation property is cleaned up to a level that is protective of human health and the environment, the cleanup process can delay redevelopment in communities affected by the BRAC process.

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<sup>1</sup>The term unexploded ordnance means military munitions that (1) have been primed, fused, armed, or otherwise prepared for action; (2) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (3) remain unexploded, whether by malfunction, design, or any other cause." 10 U.S.C. § 101(e)(5).

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This report is one in a series of reports we have issued on the BRAC environmental cleanup and transfer process.<sup>2</sup> In 2007, we reported that Congress did not have full visibility over the total cost of DOD's BRAC cleanup efforts because none of the four reports DOD prepared on various aspects of environmental cleanup presented all types of costs—past and future—to complete cleanup at each installation, and that compiling a complete picture of all costs required extracting information from multiple reports.<sup>3</sup> We also found in 2007 that opportunities existed to expedite the cleanup and transfer of unneeded 2005 BRAC properties compared with other BRAC rounds, and recommended that the military services report periodically to the Office of the Secretary of Defense (OSD) on the status and proposed strategies for transferring properties. Since 2007, DOD has taken actions to address these issues, which are described later in this report.

In its report accompanying the Military Construction, Veterans Affairs, and Related Agencies Appropriations Bill, 2016, the House Committee on Appropriations included a provision for us to update our 2007 report on the BRAC environmental cleanup progress.<sup>4</sup> In response, this report assesses the extent to which DOD has made progress (1) capturing and reporting environmental cleanup costs at installations closed under all prior BRAC rounds and (2) transferring excess property from all prior BRAC rounds and mitigating any challenges in the environmental cleanup and transfer process.

To determine the extent to which DOD has made progress in capturing and reporting environmental cleanup costs at installations closed under all prior BRAC rounds, we collected cost data from the Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health's Knowledge-Based Corporate Reporting System as of September 30, 2015.<sup>5</sup> We interviewed DOD officials with knowledge of

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<sup>2</sup>See the Related GAO Products page at the end of this report for a list of our reports related to BRAC.

<sup>3</sup>GAO, *Military Base Closures: Opportunities Exist to Improve Environmental Cleanup Cost Reporting and to Expedite Transfer of Unneeded Property*, [GAO-07-166](#) (Washington, D.C.: Jan. 30, 2007).

<sup>4</sup>H.R. Rep. No. 114-92, at 28 (2015).

<sup>5</sup>This date represents the most current data available. DOD's Knowledge-Based Corporate Reporting System is a web-based database application that provides access to information on its environmental programs. According to DOD officials, data in this system date back to 1997.

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these data to gather information, such as information about how data are collected and verified, to assess the reliability of the data. We determined these data to be sufficiently reliable for the purpose of presenting cleanup costs DOD has identified. Furthermore, we interviewed DOD and service officials to identify improvements made in their reporting of these data and to identify any omissions in the total costs reported or estimated for the future. We compared DOD's efforts to capture and report its environmental cleanup costs in its annual report to Congress on environmental cleanup to criteria, such as costs being transparent and complete, in DOD's financial management regulation and DOD's manual on the management of the Defense Environmental Restoration Program.<sup>6</sup>

To determine the extent to which DOD has made progress in transferring excess property, we collected and analyzed data from DOD's Office of Economic Adjustment as of September 30, 2015, and interviewed Office of Economic Adjustment officials with knowledge of these data to gather information, such as who has access to and oversight of the database, to assess the reliability of the data.<sup>7</sup> We found these data to be sufficiently reliable for our purposes. To identify any processes or procedures that DOD or the services have implemented to expedite the cleanup and transfer process and challenges that continue to hamper progress, we interviewed officials from the Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health and the three military departments and selected seven sites at which to interview installation officials responsible for the caretaking and cleanup of the installations as well as representatives from the local redevelopment authorities. During these site visits, we also discussed the extent to which installation officials shared lessons learned with other installation officials. We reviewed this information in light of DOD's and the Office of Management and Budget's guidance on lessons learned as well as *Standards for Internal Control in the Federal Government*.<sup>8</sup> Our site

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<sup>6</sup>See DOD 7000.14-R, *Financial Management Regulation* (December 2011), and Department of Defense Manual 4715.20, *Defense Environmental Restoration Program (DERP) Management* (Mar. 9, 2012).

<sup>7</sup>This date represents the most current data available. The Office of Economic Adjustment has been collecting these data since at least 2002.

<sup>8</sup>See Chairman of the Joint Chiefs of Staff Manual 3150.25A, *Joint Lessons Learned Program* (Sept. 12, 2014); Office of Management and Budget Circular No. A-11, *Preparation, Submission, and Execution of the Budget* (2015); and GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

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selection was guided by three main variables, specifically a mix of installations that: (1) were closed under legacy BRAC rounds (i.e., installations closed in BRAC rounds in 1988, 1991, 1993, and 1995) and installations closed under BRAC 2005, (2) are among those with the highest environmental cleanup costs, and (3) represented all three of the military departments. We visited four installations closed under legacy BRAC rounds: McClellan Air Force Base, California; Mather Air Force Base, California; Fort Ord, California; and Treasure Island Naval Station Hunters Point Annex, California; and three 2005 BRAC round closures: Fort Monmouth, New Jersey; Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania; and Brooks City-Base, Texas. Further information about our scope and methodology is in appendix I.

We conducted this performance audit from January 2016 to January 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

Since 1988, DOD has relied on the BRAC process as an important means of reducing excess infrastructure to meet changing force structure needs. DOD has undergone five BRAC rounds: 1988, 1991, 1993, 1995, and 2005. Under the five BRAC rounds, DOD has closed a total of 120 major installations and implemented a number of major and minor realignment actions.<sup>9</sup> Table 1 shows the number of major installation closures, major realignments, and minor closures and realignments for each of the five BRAC rounds.

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<sup>9</sup>DOD defines major installations as those with a plant replacement value exceeding \$100 million.



**Table 1: Summary of Actions for All Base Realignment and Closure (BRAC) Rounds**

BRAC round	Major installation closures <sup>a</sup>	Major realignments <sup>b</sup>	Minor closures and realignments	Total
1988	16	4	23	43
1991	26	17	32	75
1993	28	12	123	163
1995	27	22	57	106
2005 <sup>c</sup>	23	24	755	802
<b>Total</b>	<b>120</b>	<b>79</b>	<b>990</b>	<b>1,189</b>

Source: GAO analysis of Department of Defense information. | GAO-17-151

<sup>a</sup>DOD defines major installations as those with a plant replacement value of over \$100 million.

<sup>b</sup>DOD defines major realignments as those in which an installation has a net loss of 400 or more military and civilian personnel.

<sup>c</sup>The 2005 BRAC Commission recommended 25 base closures. Cannon Air Force Base, New Mexico, and the Navy's Broadway Complex, California, were originally on the closure list, but then it was decided that these facilities were not to be closed. In accordance with the BRAC Commission's recommendation, the Air Force developed a new mission for Cannon Air Force Base, and the Navy entered into a long-term lease for the Broadway Complex.

In accordance with the BRAC statute, DOD must complete closure and realignment actions no later than 6 years following the date that the President transmits his report on the BRAC recommendations to Congress. For BRAC 2005, the round's completion date was September 15, 2011. The statute allows environmental cleanup and property transfer actions associated with BRAC sites to exceed the 6-year time limit, and does not set a deadline for completion.<sup>10</sup> In our prior work, we have reported that the cleanup of contaminated properties has been a key factor related to delays in transferring unneeded property through the BRAC process.<sup>11</sup>

In conducting assessments of potential contamination and determining the extent of cleanup required on installations closed because of BRAC decisions, DOD must comply with cleanup standards and processes under all applicable environmental laws, regulations, and executive orders. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, authorizes cleanup

<sup>10</sup>Defense Base Closure and Realignment Act of 1990, Pub. L. No. 101-510, Title XXIX (codified as amended at 10 U.S.C. § 2687 note).

<sup>11</sup>GAO, *Military Base Closures: Progress in Completing Actions from Prior Realignments and Closures*, [GAO-02-433](#) (Washington, D.C.: Apr. 5, 2002) and [GAO-07-166](#).

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actions at federal facilities where there is a release of hazardous substances or the threat of such a release that can present a threat to public health and the environment.<sup>12</sup> The Superfund Amendments and Reauthorization Act of 1986 added provisions to CERCLA specifically governing the cleanup of federal facilities, including active military installations and those closed under BRAC, and required the Secretary of Defense to carry out the Defense Environmental Restoration Program.<sup>13</sup> Under the Defense Environmental Restoration Program, DOD conducts environmental restoration activities at active installations, Formerly Used Defense Site properties, and BRAC locations in the United States to address DOD contamination from hazardous substances, pollutants, or contaminants; unexploded ordnance, discarded military munitions, or munitions constituents; or building demolition and debris removal. Types of environmental contaminants found at military installations include solvents and corrosives; fuels; paint strippers and thinners; metals, such as lead, cadmium, and chromium; and unique military substances, such as nerve agents and unexploded ordnance. The program includes the investigation, identification, and cleanup of contamination from hazardous substances, pollutants, and contaminants; the correction of other environmental damage (such as detection and disposal of unexploded ordnance) that creates a threat to the public health or environment; and the demolition and removal of unsafe buildings and structures. The U.S. Environmental Protection Agency and state regulatory agencies are responsible for overseeing cleanup decisions to ensure that applicable requirements are met.

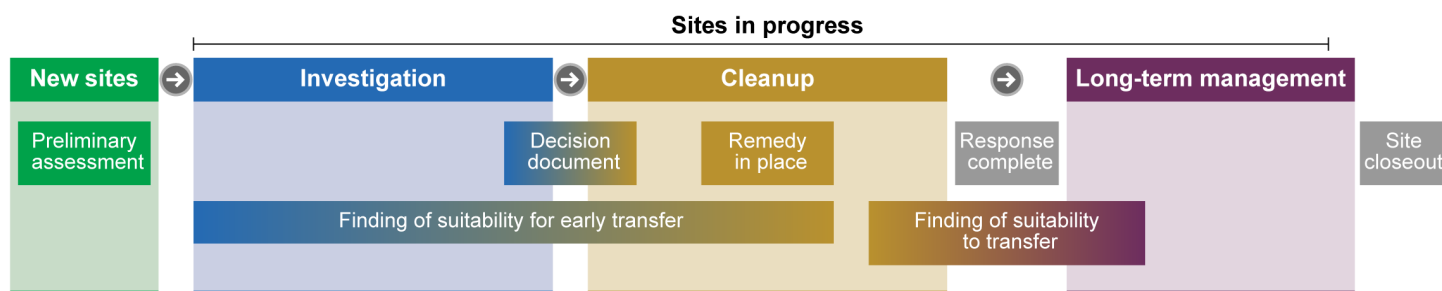
In general, the services, as the owners of the property, put final cleanup remedies in place before the property is transferred. However, under some circumstances the services may conduct an early transfer before cleanup has been completed. When remedies are in place for addressing the contamination of a former installation or the services and the communities have agreed to an early transfer, the property can be transferred to a local redevelopment authority responsible for implementing a plan for civilian reuse. Figure 1 shows the major milestones in the cleanup and transfer process required under CERCLA.

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<sup>12</sup>42 U.S.C. §§ 9601-9630, at § 9620.

<sup>13</sup>Pub. L. No. 99-499, § 120 (1986) (codified as amended at 10 U.S.C. § 2700 et seq.).

**Figure 1: Major Milestones in CERCLA Cleanup with BRAC Transfer**



BRAC Base Realignment and Closure  
 CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Source: GAO analysis of Department of Defense information. | GAO-17-151

Since 2005, we have issued more than 30 reports and testimonies on BRAC planning, implementation, costs, and savings that highlight information DOD can use to improve the BRAC recommendation development and implementation process. For example, in 2015 we reported that a variety of homeless assistance was provided as a result of BRAC 2005 but that DOD and the Department of Housing and Urban Development do not require tracking of data about the transfer of property for homeless assistance. We recommended that DOD and the Department of Housing and Urban Development track property transfer status. DOD partially concurred with this recommendation and stated that action on this recommendation is pending the authorization of a future BRAC round. See the Related GAO Products page at the end of this report for a list of reports related to BRAC.

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## DOD's Latest Report to Congress Captures More-Comprehensive Environmental Cleanup Cost Information, but Omits Emerging Contaminants' Cleanup Costs

DOD has captured and reported more-comprehensive cost information in its environmental cost reporting for installations closed under BRAC; however, DOD has not reported to Congress that the cleanup of emerging contaminants could significantly increase the total cost of environmental cleanup at installations closed by the BRAC process.<sup>14</sup>

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## DOD Has Improved Its Environmental Cleanup Cost Reporting since 2007

DOD has improved its reporting of environmental cleanup costs to Congress by capturing more-comprehensive information that we identified as missing from its 2007 annual report.<sup>15</sup> For example, we reported in 2007 that the costs for environmental cleanup for installations closed under the 2005 BRAC round were not complete partly because DOD excluded the cleanup costs for contaminants released on DOD property after 1986 and munitions released on DOD property after 2002.<sup>16</sup> We recommended in our 2007 report that DOD provide all costs—past and future—required to complete environmental cleanup at each BRAC installation and to fully explain the scope and limitations of all the environmental cleanup costs that DOD reports to Congress. In response, in December 2008 DOD revised the activities eligible for the Defense Environmental Response Program by including the cleanup for all identified munitions and hazardous contaminants.<sup>17</sup> In its *Fiscal Year*

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<sup>14</sup>Emerging contaminants are defined by DOD as contaminants that have a reasonably possible pathway to enter the environment, present a potential unacceptable human health or environmental risk, and do not have regulatory standards based on peer-reviewed science, or their regulatory standards are evolving due to new science, detection capabilities, or pathways. See DOD Instruction 4715.18, *Emerging Contaminants (ECs)* (June 11, 2009).

<sup>15</sup>[GAO-07-166](#).

<sup>16</sup>These cleanup activities were referred to as non-Defense Environmental Restoration Program cleanup activities and typically involved the closure and cleanup of properties that included landfills, training ranges, and underground storage tanks.

<sup>17</sup>Office of the Under Secretary of Defense, *Interim Policy Memorandum for the Defense Environmental Restoration Program (DERP) Eligibility* (Dec. 29, 2008).

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*2009 Defense Environmental Programs Annual Report to Congress*, DOD began reporting cleanup costs for all identified munitions and contaminants and continued to report these costs in subsequent reports to Congress including the *Defense Environmental Programs Annual Report to Congress for FY 2015*.<sup>18</sup>

In addition, we reported in 2007 that DOD had not reported complete environmental cleanup costs on installations closed under the 2005 BRAC round partly because it omitted additional information such as program-management costs—indirect, overhead, and management costs related to the environmental cleanup that cannot be attributed to a specific installation. In response, DOD issued an update to its Defense Environmental Restoration Program in March 2012 clarifying the requirement for the services to include program-management costs in their cleanup costs estimates and including these costs in the 2015 annual report to Congress.

In its annual report to Congress, DOD reported that it spent \$609.6 million<sup>19</sup> to clean up properties closed under BRAC in fiscal year 2015. DOD estimated as of September 30, 2015, that it will need about \$3.4 billion<sup>20</sup> to complete environmental cleanup for installations closed under all BRAC rounds, including \$475 million in program-management costs. Through fiscal year 2015, DOD has spent approximately \$11.5 billion, including \$813 million in program-management costs, for environmental

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<sup>18</sup>DOD submitted the *Fiscal Year 2009 Defense Environmental Programs Annual Report to Congress* pursuant to section 2706 of Title 10, U.S. Code in addition to sections 9620(e)(5) and 9621(c) of Title 42, U.S. Code. The *Defense Environmental Programs Annual Report to Congress for FY 2015* contains information that addresses the funding invested in and progress of DOD's environmental programs—in accordance with section 2711 of Title 10, U.S. Code.

<sup>19</sup>DOD obligated a total of \$609.6 million that includes funding for site level and program management costs (\$384 million), site level funding for the military munitions response program funding (\$206.4 million), and BRAC planning and compliance funding (\$19.2 million) in fiscal year 2015 for cleanup at BRAC installations.

<sup>20</sup>DOD's financial statement reflects \$3.9 billion in financial liability for the environmental cleanup of installations closed under BRAC. This differs from the \$3.4 billion reported to us by DOD (\$2.9 billion in environmental cleanup costs for fiscal year 2015 that are directly attributed to individual sites and \$475 million for program-management costs). The remaining \$500 million difference is related to costs to remove arsenic, costs for correcting cleanup activities and closure requirements, and unliquidated obligations for work not yet performed included in DOD's financial statement.

cleanup of installations closed under all BRAC rounds.<sup>21</sup> Of this \$3.4 billion, DOD will need about \$435 million<sup>22</sup> to complete the cleanup for installations under the 2005 BRAC round, including \$427 million<sup>23</sup> for major installations, and \$2.5 billion to complete the cleanup for installations under the legacy rounds (installations closed under the 1988, 1991, 1993, and 1995 BRAC rounds). Table 2 shows the total environmental cleanup costs including the past and remaining costs to complete the environmental cleanup for the 23 major installations closed under BRAC 2005.

**Table 2: Base Realignment and Closure 2005 Major Closures' Past Costs and Remaining Costs for Environmental Cleanup to Completion, as of September 30, 2015**

Dollars (in millions)

Service	Installation	Past costs	Remaining costs to complete	Total
Army	Umatilla Chemical Depot, Oregon <sup>a</sup>	75	47	122
	Fort Monmouth, New Jersey <sup>b</sup>	45	29	74
	Fort Monroe, Virginia	9	13	22
	Riverbank Army Ammunition Plant, California	24	20	44
	Fort Gillem, Georgia	34	6	40
	Kansas Army Ammunition Plant, Kansas	23	5	28
	Tooele Army Depot South, Utah <sup>c</sup>	18	0	18
	Fort McPherson, Georgia	8	2	10
	Lone Star Army Ammunition Plant, Texas	6	4	10
	Mississippi Army Ammunition Plant, Mississippi	2	2	4
	Newport Chemical Depot, Indiana <sup>d</sup>	2	0	2
	Selfridge Army Activity, Michigan <sup>e</sup>	0	0	0
Navy	Naval Weapons Station Seal Beach, Concord Detachment, California	72	60	132
	Naval Air Station Brunswick, Maine	53	30	83
	Naval Air Station Willow Grove, Pennsylvania	23	50	73

<sup>21</sup>There are additional costs not tied to a specific installation that DOD refers to as program management costs for the environmental cleanup programs. These costs cover overhead and management costs for personnel including compensation and travel expenses.

<sup>22</sup>Of the \$435 million, \$3 million is for the remaining cleanup at installations impacted by prior BRAC rounds.

<sup>23</sup>Of the \$427 million, \$1 million is for the remaining cleanup at the former Fort Monmouth under the BRAC 1993 round.

	Naval Air Station Atlanta, Georgia <sup>f</sup>	0	0	0
	Naval Station Pascagoula, Mississippi <sup>g</sup>	0	0	0
	Naval Station Ingleside, Texas <sup>h</sup>	0	0	0
<b>Air Force</b>	Galena Forward Operating Location, Alaska	92	143	<b>235</b>
	Onizuka Air Force Station, California <sup>i</sup>	0	0	0
	Brooks City-Base, Texas	2	8	<b>10</b>
	General Mitchell Air Reserve Station, Wisconsin <sup>j</sup>	0	7	<b>7</b>
	Kulis Air Guard Station, Alaska <sup>k</sup>	0	1	<b>1</b>
<b>Total</b>		<b>488</b>	<b>427</b>	<b>915</b>

Source: GAO analysis of Department of Defense data. | GAO-17-151

Notes: Some of the funding used for the cleanup of installations in the table closed under the BRAC 2005 round was also used, or will be used, to cleanup installations closed under the prior BRAC rounds. Totals may not add due to rounding.

<sup>a</sup>Of the \$75 million in past cleanup costs at Umatilla Chemical Depot, \$56 million was used for the cleanup of sites impacted by the 1998 BRAC round.

<sup>b</sup>Of the \$45 million in past cleanup costs at Fort Monmouth, \$15 million was for the cleanup of sites impacted by the 1993 BRAC round. Of the remaining cost of \$29 million, \$1 million is for the cleanup of sites impacted by the 1993 BRAC round.

<sup>c</sup>BRAC-funded cleanup of Tooele Army Depot South (formerly named Deseret Chemical Depot) was completed in 2007.

<sup>d</sup>Cleanup of Newport Chemical Depot was completed in 2012.

<sup>e</sup>According to Army BRAC officials, Selfridge Army Activity is also known as U.S. Army Garrison Michigan and no environmental cleanup was needed.

<sup>f</sup>All of the property from Naval Air Station Atlanta was transferred to the National Guard and therefore no cleanup was needed.

<sup>g</sup>According to Navy BRAC officials, there were no environmental cleanup costs at Naval Station Pascagoula because there was no contamination. This property reverted to the state of Mississippi.

<sup>h</sup>According to Navy BRAC officials, there were no environmental cleanup costs at Naval Station Ingleside because there was no contamination. This property reverted to the Port of Corpus Christi, Texas.

<sup>i</sup>Cleanup of Onizuka Air Force Station was completed in 2015.

<sup>j</sup>The amount is reported as zero because the actual amount is below \$500,000.

Table 3 shows the 10 installations from the legacy BRAC rounds (i.e., 1988, 1991, 1993, and 1995) with the highest remaining environmental cleanup costs based on cost information from fiscal year 2015. The cost estimate of \$1.2 billion to complete the environmental cleanup at these 10 BRAC installations accounts for 41 percent of the total remaining environmental cleanup costs (\$2.9 billion) for installations under all BRAC rounds.

**Table 3: Ten Installations with the Most Expensive Costs for Completing Cleanups (from the 1988, 1991, 1993, and 1995 Base Realignment and Closure Rounds), as of September 30, 2015**

Service	Installation	Remaining cost to complete (dollars in millions)
Navy	Treasure Island Naval Station Hunters Point Annex, California	266
Army	Fort Ord, California	203
Air Force	Mather Air Force Base, California	115
Army	Pueblo Chemical Depot Colorado	114
Air Force	McClellan Air Force Base, California	105
Navy	Naval Air Facility Adak, Alaska	90
Army	Fort Wingate Depot Activity New Mexico	75
Air Force	Castle Air Force Base, California	74
Air Force	Wurtsmith Air Force Base, Michigan	72
Army	Savanna Army Depot Activity, Illinois	71
<b>Total</b>		<b>1,185</b>

Source: GAO analysis of Department of Defense data. | GAO-17-151

## DOD Has Not Notified Congress about Increasing Cleanup Costs Related to Emerging Contaminants

DOD did not notify Congress in its most recent report in fiscal year 2015 on environmental programs that the costs for environmental cleanup at BRAC installations will significantly increase due to the high cost of remediating emerging contaminants, primarily perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), two types of perfluorinated compounds, at many of the installations closed under BRAC.<sup>24</sup> According to DOD officials, the services are still investigating the scope of the problem and the costs are not fully defined.<sup>25</sup>

Although DOD officials have not determined the total costs for cleaning up emerging contaminants at installations closed under BRAC, service BRAC officials stated that the cost of cleaning up perfluorinated compounds—specifically PFOS and PFOA—from installations closed

<sup>24</sup>DOD, *Defense Environmental Programs Annual Report to Congress for FY 2015*.

<sup>25</sup>PFOS and PFOA are fully fluorinated, organic compounds and are the two perfluorinated compounds that have been produced in the largest amounts in the United States. Through 2001, perfluorinated compounds were used to manufacture Aqueous Film Forming Foam, which was used by DOD and other agencies, including local airports, to extinguish petroleum fires at training activities and crash sites. We will be reporting separately on DOD's management of emerging contaminants on active and closed military bases in 2017.



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under BRAC will likely be significant. For example, Air Force BRAC officials told us that the agency has programmed \$100 million over the next 5 years for the investigation and remediation of emerging contaminants. Further, they stated that this amount does not include the additional cost to complete the cleanup of emerging contaminants such as PFOS and PFOA. Navy BRAC officials stated that the cleanup of PFOS and PFOA at both active and closed installations could greatly increase the environmental cleanup costs, into the billions of dollars. Also, Army BRAC officials stated that the cleanup of PFOS and PFOA is a serious issue that will greatly affect environmental cleanup costs.

Service officials stated they are continuing to identify and investigate sites on installations, such as water systems, fire training activities, crash sites, and aircraft hangers that may have been contaminated with PFOS or PFOA. For example, Air Force BRAC officials stated that as of August 2016 they had identified 30 installations requiring preliminary assessment investigations for PFOS and PFOA, but as of October 2016, the Air Force anticipates that only 25 of these installations will require further investigation. Navy BRAC officials stated that as of September 2016 they had identified 35 BRAC installations with sites that are contaminated or may be potentially contaminated with PFOS and PFOA. Further, Navy BRAC officials stated that this number is likely to increase as they conduct additional investigations. An Army BRAC official stated that Army personnel have begun sampling sites at installations where PFOS and PFOA may have been used, but have not yet determined which installations may be potentially contaminated.

According to service BRAC officials, it could take many years to identify new sites, investigate the soil and water system, and conduct cleanup action for removing perfluorinated compounds. However, the presence of perfluorinated compounds has already affected DOD's ability to transfer property. For example, the transfer of property at a former Navy installation was delayed because in May 2016 levels of PFOS and PFOA that exceeded the Environmental Protection Agency's health advisory levels were found in the local drinking water.<sup>26</sup> Although the agency's

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<sup>26</sup>There is currently no federal regulatory standard for the maximum level of perfluorinated compounds that can be found in drinking water. The Environmental Protection Agency has established a nonenforceable lifetime health advisory level of 70 parts per trillion for the combined concentration in drinking water of two perfluorinated compounds, PFOS and PFOA. Environmental Protection Agency health advisories are not enforceable and nonregulatory as their purpose is to provide technical information to state agencies and other public health officials on health effects and other matters.

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health advisory is not binding, DOD officials stated that they want to ensure that the levels of PFOS and PFOA in drinking water supplied to residents are below the advisory levels.

According to DOD's Financial Management Regulation, transparency and complete accountability in financial reporting and budgetary backup documents are essential elements for providing Congress with a more-comprehensive picture of total costs so it can make appropriate budgetary trade-off decisions to ensure the expeditious cleanup and transfer of properties and ultimately realize savings for the U.S. government.<sup>27</sup> Also, DOD's manual on the management of the defense environmental restoration program states that DOD shall improve its financial management and reporting of environmental cleanup costs by providing accurate, complete, reliable, timely, and auditable financial information.<sup>28</sup>

However, DOD's annual report to Congress does not make any mention of the significant increase in costs that the department is likely to incur identifying and cleaning up these contaminants. As a result, DOD has not provided Congress with all of the available information on total cleanup costs because its annual report did not reflect that cleanup costs will significantly increase due to PFOS and PFOA on many DOD installations including those closed under BRAC. Although DOD has been investigating the presence of PFOS and PFOA at DOD installations for several years, according to DOD officials, at the time of the last report to Congress, the extent of the issue was not yet known. DOD officials acknowledge they have not provided Congress with a complete picture of total cleanup costs because DOD is working to identify locations where DOD may have a known or suspected release of PFOS and PFOA on DOD installations, including those closed under BRAC. DOD officials told us they have briefed certain committees of Congress on this issue, including the likelihood of increased costs for environmental cleanup. However, DOD has not provided the full Congress with notification through its annual report that DOD's costs to clean up these contaminants are expected to increase significantly. While the department does not know the exact amount of the costs, DOD has an opportunity to notify Congress of the expected increase and provide its best estimate of

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<sup>27</sup>DOD 7000.14-R, *Financial Management Regulation*.

<sup>28</sup>DOD Manual 4715.20, *Defense Environmental Restoration Program (DERP) Management*.

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the costs based on known information at the time of its annual report. Without DOD notifying Congress about this expected cost increase and providing the best estimate of costs for the cleanup of perfluorinated compounds and other emerging contaminants to the extent known, Congress will lack total visibility over this potentially significant BRAC environmental cleanup effort and will not have necessary information to make more-informed funding decisions.

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## DOD Has Made Progress in Transferring Excess Property, but Information on Successful Mitigation Strategies Is Not Widely Available

DOD has used a variety of methods since our 2007 report to continue to make progress in transfers of unneeded BRAC property. At the same time, installation officials stated that challenges remain, including unique situations that will require more time to overcome, and others that are more widespread, such as navigating multiple regulatory agencies or dealing with emerging contaminants. Installation officials indicated that lessons learned from installations that have successfully navigated these more-widespread issues are not easily obtained and if they were available it could help them and future officials facing cleanup of BRAC property expedite the cleanup and transfer of properties.

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## DOD Has Made Progress in Transferring Unneeded Properties Identified in BRAC Rounds through a Variety of Methods

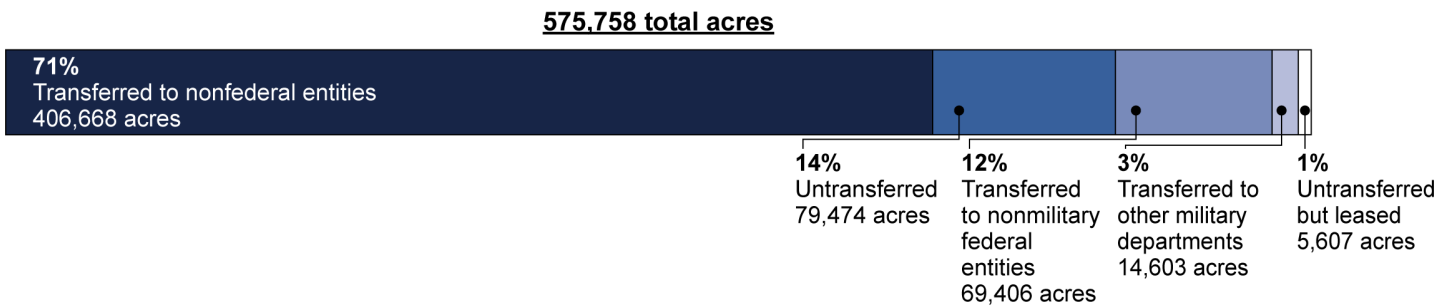
DOD has reported transferring about 85 percent (490,678 out of 575,758 acres) of unneeded property identified in all BRAC rounds through a variety of methods, which is an increase from the 78 percent of property transferred before and during 2007, the year of our previous review.<sup>29</sup> Regarding only the 2005 BRAC round, DOD reported that it had transferred about 66 percent (60,224 out of 90,914 acres) of its unneeded property as of September 30, 2015. Figure 2 shows the disposition of the unneeded acreage from all prior BRAC rounds. The bulk of the transfers, 71 percent (406,668 acres) were to nonfederal entities. While DOD's goal is to transfer property to other entities for reuse, as we noted in our 2007 report, leasing property can also afford the user and DOD some benefits. As we also reported in 2007, communities, for example, can choose

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<sup>29</sup>In [GAO-07-166](#), we reported approximately 78 percent of 502,500 unneeded acres had been disposed of by DOD. This unneeded acreage differs from the approximately 484,844 unneeded acres from the legacy BRAC rounds reported as of September 30, 2015, because as property is transferred, more-accurate surveys are completed, which changes the amount of available acres from one year to the next. Further, some acreage initially declared excess has been retained by DOD, thus decreasing the acreage available for transfer.

leasing as an interim measure while awaiting final environmental cleanup and thereby promote property reuse and job creation. DOD also benefits, in some cases, as the communities assume responsibility for costs of protecting and maintaining these leased properties. By adding leased acres to the number of transferred acres, the amount of unneeded BRAC property being reused rises to 86 percent, according to our analysis.

Figure 2: Disposition of Unneeded Base Realignment and Closure Acreage, as of September 30, 2015



Source: GAO analysis of Department of Defense data. | GAO-17-151

Note: Percentages do not add to 100 due to rounding.

Congress has provided DOD with a wide range of property transfer methods and tools to expedite the cleanup and transfer of unneeded BRAC property, including public benefit conveyances and negotiated property sales. The closure and realignment of individual installations creates opportunities for those unneeded properties to be made available to others for reuse. When an installation is closed under BRAC, the unneeded property is reported as excess. Federal property disposal laws require DOD to first screen excess property for possible reuse by defense and other federal agencies. If no federal agency needs the property, it is declared surplus and is made available to nonfederal parties, including state and local agencies, local redevelopment authorities, and the public, using the various transfer tools as shown in table 4.

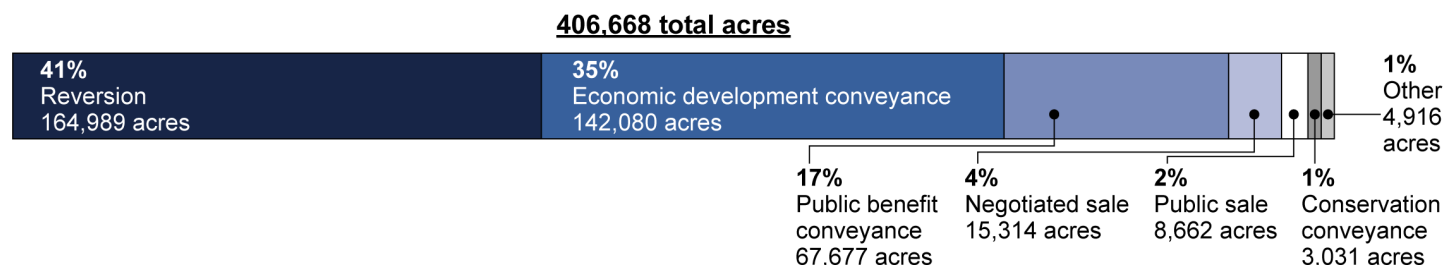
**Table 4: Property Transfer Alternatives under the Base Realignment and Closure (BRAC) Process**

Property transfer alternative	Purpose of property transfer alternative
Public benefit conveyance	Authorizes real and personal property transfers to state and local governments and certain nonprofit organizations for public purposes. Examples include schools, parks, airports, ports, public-health facilities, historic monuments, and wildlife conservation.
Conservation conveyance	Authorizes a military department to convey surplus property that is suitable for conservation purposes to a state or local government, or to a nonprofit organization that exists primarily for the purpose of natural resource conservation.
Economic development conveyance	Authorizes a military department to convey real and personal BRAC property to a local redevelopment authority for the purposes of job generation on the installation.
Negotiated sale	Disposes of property by negotiated sale only under limited circumstances. Negotiated sales to public bodies can be conducted only if a public benefit, which would not be realized from competitive sale or authorized public benefit conveyance, will result from the negotiated sale. The grantee must pay no less than fair-market value based upon highest and best use and an appraisal.
Public sale	Allows the military department, in consultation with the local redevelopment authority, to determine when public sale is the best method to dispose of a parcel. Public sale approaches include sealed bids, Internet auctions, and auction on the site to the highest bidder.
Reversion	Property for military installations was sometimes obtained from state and local governments at a reduced price or at no cost. In these cases, the deed or other instrument conveying the property to the military may contain rights or clauses that provide for the reversion of the property to its former owner once the military need has ended.
Special legislation	Congressional action through legislation determining the terms and conditions for transferring BRAC properties.

Source: GAO analysis of DOD information. | GAO-17-151

In 2007, we recommended that the services report periodically to OSD on the status and proposed strategies for transferring excess BRAC properties. In response, OSD began requiring the services to report on the status of all excess property including the available acreage and the authority used to transfer the property. In transferring its unneeded property from the previous BRAC rounds, our analysis shows that DOD primarily relies on reversions, economic development conveyances, and public benefit conveyances. Figure 3 shows the breakdown of the methods used by DOD for transferring property from all of the BRAC rounds.

**Figure 3: Methods Used to Transfer Unneeded Base Realignment and Closure (BRAC) Property to Nonfederal Entities in All BRAC Rounds, as of September 30, 2015**



Source: GAO analysis of Department of Defense data. | GAO-17-151

Note: Numbers do not add due to rounding.

Improvements in funding for BRAC-related expenses and cleanup technology have expedited the cleanup process and transfer of property. For example, in 2013, Congress established a single BRAC account to fund all BRAC-related expenses for all BRAC rounds, including costs for environmental cleanup. Previously, there were two BRAC accounts—one to fund activities related to legacy BRAC rounds and one to fund activities related to the 2005 BRAC round. According to DOD and Army officials, the single account has been beneficial in funding cleanup expenses. According to Army officials, the Army was able to sell properties closed under BRAC 2005, and the funds from these sales were available to use to fund environmental cleanup. In addition, as we reported in 2007 and according to Army officials we spoke with on this review, installations closed in the BRAC 2005 round typically needed less environmental cleanup because the services had already implemented cleanup programs while the installations were active. As a result, Army officials told us there was a large surplus in the BRAC 2005 account. With the merging of the two accounts, the Army was able to use the surplus money from the 2005 BRAC account to clean up properties closed in the legacy BRAC rounds.

In addition, improvements in cleanup technology have expedited environmental restoration in some locations. In our 2007 report, we reported that the technology to detect and clean up unexploded ordnance was limited and not fully effective. However, since our last report there have been advances in this technology that make the cleanup of unexploded ordnance faster and more effective. For example officials at Fort Ord, California, informed us that DOD has developed a new tool, the advanced geophysical classification technology, commonly referred to as the advanced classification. This technology enables personnel to

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address the potential explosives safety hazards at munitions response sites by identifying buried metal objects and determining whether they are military munitions or harmless debris. According to officials, the use of the advanced geophysical classification technology will allow DOD to reduce cleanup time and costs. Installation officials also told us about using innovative techniques for cleaning up contaminants in groundwater, including injecting the groundwater with oil or organisms to facilitate the natural attenuation of contaminants; these techniques should help expedite cleanup at BRAC locations.

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**Officials Identified Challenges That Impede Progress, but DOD Does Not Have a Method for Installation Officials to Share Lessons Learned on Successful Mitigation Strategies**

Installation officials and local redevelopment authority representatives involved in the cleanup, transfer, and reuse of the property identified challenges that continue to impede the environmental cleanup and transfer process. Officials told us that some of their challenges are due to unique situations that have to be addressed individually, but other challenges are more common and widespread. Installation officials told us that not having information available on previous successful mitigation strategies that may have been identified for common and widespread challenges hampers their ability to expedite the cleanup and transfer of some properties.

The unique challenges installation officials told us about during our site visits result in additional time needed to conduct the environmental cleanup and ultimately to transfer the property. For example, at Fort Ord, California, the Army needs to burn the brush on the former training range area to clean up unexploded ordnances. However, to perform this controlled burn, the weather conditions need to be ideal due to concerns of the fire spreading in dry conditions. In 2015, the Army was unable to execute this burn due to unfavorable weather conditions. As of September 2016, the Army still had not been able to conduct burns at Fort Ord because of wildfires in the area that required the use of the fire resources that would be necessary to control the burns and because of dry weather conditions. Another unique challenge that results in additional time to execute cleanup is when the properties are at remote locations. For example, the Air Force can ship supplies and perform cleanup only during certain months of the year at the former Galena Forward Operating Location, Alaska, because of the severely cold weather that freezes the river used for transportation. This limitation cuts down on the ability to ship supplies and equipment to the installation for cleanup and to remove waste from the site for disposal. The Navy faces similar challenges with the cleanup at the former Naval Air Facility Adak, Alaska.

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Officials told us about two other challenges that are more common and widespread. First, officials at five of the seven installations we visited told us that a key challenge across installations is coordinating with the large number of regulatory agencies involved in environmental cleanup issues. For example, installation and local redevelopment authority officials from California stated that there are multiple environmental agencies in California, each with its own area of concern, and that the agencies are not always easy to coordinate with. In addition, some states, including California and New Jersey, have stricter standards than the Environmental Protection Agency has on certain contaminants, and the services must clean up the contaminated property to the stricter state level. Further, certain states, including Alaska and California, do not allow disposal or storage of radiological contaminants in the state, and these contaminants must be shipped to another state. For example, Navy BRAC officials stated that they dispose of and transport radiological waste from cleanup operations at Treasure Island Hunters Point, California—closed under the 1991 BRAC round—to a Utah landfill designated to receive this kind of waste. According to Navy BRAC officials, the additional environmental cleanup costs for disposing of and transporting radiological waste to the Utah landfill versus keeping the waste in California is over \$1 million per year.

Secondly, officials told us that the newly discovered presence of emerging contaminants is a challenge that has delayed the transfer of property and extended the timeline for cleanup in some locations, especially former airfields. The most common emerging contaminants on DOD installations are perfluorinated compounds, specifically PFOS and PFOA, found in fire-fighting foam used throughout the nation by the military and commercial airports. In 2009, the Environmental Protection Agency issued a provisional health advisory establishing levels at 400 parts per trillion for PFOA and 200 parts per trillion for PFOS in drinking water. In May 2016, EPA replaced the provisional advisories with a lifetime health advisory for PFOS and PFOA of 70 parts per trillion in drinking water. This level applies both to the chemicals individually and to the concentrations of both, when combined.<sup>30</sup> Although Environmental

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<sup>30</sup>The Environmental Protection Agency develops health advisories to provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. Health advisories are nonenforceable and nonregulatory and provide technical information to state agencies and other public-health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination.



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Protection Agency health advisories are nonenforceable, DOD issued an instruction in 2009 stating that DOD will perform sampling, conduct site-specific risk assessments, and take actions for emerging contaminants released from DOD facilities.<sup>31</sup> According to DOD officials, DOD is in the beginning stages of determining the extent of this problem, and has discovered levels of PFOS and PFOA that exceed the Environmental Protection Agency's health advisory level at numerous installations, including Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania, and Pease Air Force Base, New Hampshire.

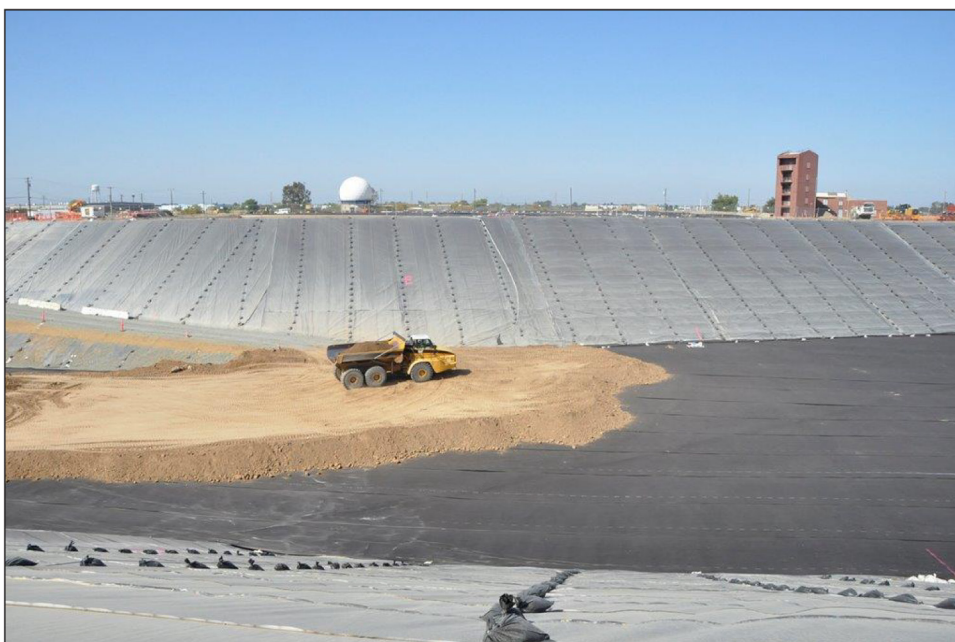
Installation officials we spoke with stated that they periodically reach out to officials at other installations informally, even across services, for help in learning how to expedite or resolve these challenges as well as others, but there is no formal mechanism, such as a web-based database, within DOD to capture this type of information. Officials stated that a system to capture lessons learned would assist them in addressing challenges at their installations and would be important for any future BRAC rounds, as current personnel may no longer be employed within the department. One example of an innovative approach to dealing with the disposal of radioactive material is at the former McClellan Air Force Base, California. In 2007, we reported that traces of plutonium were found during a routine cleanup in September 2000, causing a cost increase of \$21 million and extending the completion schedule beyond 2030. However, since 2007, officials told us that they realized a better way to decrease the costs of disposing of radioactive material by using a consolidation landfill on the installation. According to installation officials, the Air Force will save over \$200 million by disposing of this material in this manner rather than shipping the material to a disposal facility in another state. Figure 4 shows the consolidation landfill at the former McClellan Air Force Base.

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<sup>31</sup>DOD Instruction 4715.18, *Emerging Contaminants (ECs)*.

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**Figure 4: Consolidation Landfill at Former McClellan Air Force Base, California**



Source: Air Force. | GAO-17-151

DOD has created a joint lessons-learned program, and the guidance for this program states that recording, analyzing, and developing improved processes, procedures, and methods based on lessons learned are primary tools in developing improvements in overall performance.<sup>32</sup> Further, the Office of Management and Budget's guidance on the preparation, submission, and execution of the budget states that agencies should consider lessons learned from past efforts to continuously improve service delivery and resolve management challenges.<sup>33</sup> Although this guidance is not specific to environmental cleanup, it provides good examples of how lessons-learned programs can be structured. Further, *Standards for Internal Control in the Federal Government* state that communication throughout an entity is an important part of achieving the entity's objectives and includes the communication of quality information to all levels of the entity.<sup>34</sup> The Office of the Deputy Assistant Secretary of

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<sup>32</sup>Chairman of the Joint Chiefs of Staff Manual 3150.25A.

<sup>33</sup>Office of Management and Budget Circular No. A-11.

<sup>34</sup>[GAO-14-704G](#).

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Defense for Environment, Safety, and Occupational Health currently oversees a Cleanup Committee composed of senior environmental officials from each of the services. The purpose of this committee is to communicate, discuss, and resolve cleanup issues. According to DOD officials, this group meets regularly to share lessons learned and improve DOD policy. However, installation officials do not attend these meetings and do not have a mechanism to routinely record and share information on lessons learned, successful strategies, helpful contacts, or insight they have gained from previous DOD cleanups. Installation officials we spoke with indicated that a repository or method to record and share this type of information would be beneficial to others who face similar challenges in the future. Without a repository or method to record and share lessons learned, installation personnel charged with implementing cleanup efforts are missing opportunities to share lessons learned about how various locations have successfully addressed cleanup challenges and may therefore be at risk of duplicating errors made in the past by others who faced the same kind of cleanup issues.

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## Conclusions

The cleanup of environmental contaminants on installations closed under BRAC has historically been a key impediment to the transfer and ultimate reuse of the property by the community. Environmental cleanup is costly, and DOD estimates that it will need about \$3.4 billion in addition to the approximately \$11.5 billion it has already spent to manage and complete environmental cleanup of installations closed under all BRAC rounds. Since 2007, DOD has improved its reporting of these cleanup costs to Congress by including in its annual reports information on how these additional costs have contributed to the overall cost increases DOD has experienced in implementing the BRAC recommendations. Despite these improvements, DOD has not reported to Congress how the cleanup of emerging contaminants, especially certain perfluorinated compounds, at installations closed under BRAC will significantly increase the estimated cleanup costs. Without including such information in its annual report, DOD has not provided Congress full visibility over the expected increase in costs and the necessary information to make more-informed funding decisions.

DOD has also made progress in transferring property closed under BRAC; however, officials identified several challenges in the cleanup and transfer process, and some of these challenges may be aided by sharing information from others who have successfully developed mitigation strategies or navigated the complex regulatory environment. Without a repository or method to record and share lessons learned, installation

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personnel charged with implementing cleanup efforts may face unnecessary delays or obstacles to cleanup issues that could have been alleviated from the valuable insight gained by prior DOD experience with these issues.

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## Recommendations for Executive Action

To provide Congress with better visibility over the costs for the environmental cleanup of properties from all BRAC rounds to inform future funding decisions, we recommend that the Secretary of Defense direct the Secretaries of the military departments to include in future annual reports to Congress that environmental cleanup costs will increase due to the cleanup of perfluorinated compounds and other emerging contaminants, and to include best estimates of these costs as additional information becomes available.

To help the services more effectively share information and address environmental cleanups and transfers, we recommend that the Secretary of Defense direct the Secretaries of the military departments to create a repository or method to record and share lessons learned about how various locations have successfully addressed cleanup challenges.

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## Agency Comments

We provided a draft of this report to DOD for review and comment. In its written comments, DOD concurred with our recommendations. DOD also provided technical comments which we incorporated as appropriate. DOD's comments are printed in their entirety in appendix II.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense; the Secretaries of the Army, the Navy, and the Air Force; and the Assistant Secretary of Defense for Energy, Installations, and Environment. In addition, the report is available at no charge on our website at <http://www.gao.gov>.

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If you or your staff have any questions about this report, please contact me at (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

A handwritten signature in black ink, reading "Brian Lepore". The signature is fluid and cursive, with the first name "Brian" and last name "Lepore" clearly distinguishable.

Brian J. Lepore,  
Director  
Defense Capabilities and Management

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# Appendix I: Scope and Methodology

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To determine the extent to which the Department of Defense (DOD) has made progress in capturing and reporting environmental cleanup costs at installations closed under all prior Base Realignment and Closure (BRAC) rounds, we collected cost data from the Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health's Knowledge-Based Corporate Reporting System as of September 30, 2015.<sup>35</sup> We specifically analyzed information from the database on environmental cleanup costs from fiscal year 2015—both past and future—for all installations closed under the 2005 BRAC round as well as the costs for installations closed under the legacy rounds (installations closed in BRAC rounds 1988, 1991, 1993, and 1995). We interviewed DOD officials with knowledge about these data to gather information to assess the reliability of the data. We determined these data to be sufficiently reliable for the purpose of presenting costs DOD has identified. We reviewed and examined DOD regulations and guidance on requirements for estimating and reporting costs, such as DOD's Financial Management Regulation and DOD Manual 4715.20, *Defense Environmental Restoration Program (DERP) Management*. In addition, we interviewed officials with the Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health and the services to gain an understanding of how the estimates were derived from the services and reported to Congress. We also examined the *Defense Environmental Programs Annual Report to Congress for Fiscal Year 2015*—the most-recent report—to determine what environmental cleanup costs and information were last reported to Congress. We compared DOD's efforts to capture and report on environmental cleanup costs in its annual report to Congress on environmental cleanup to criteria, such as costs being transparent and complete, in DOD's financial-management regulations and DOD's manual on the management of the Defense Environmental Restoration Program in conducting our analysis of the data.<sup>36</sup> Furthermore, we interviewed key officials with knowledge of BRAC's cost reporting and estimating from DOD and the services to determine the extent to which DOD has made improvements in reporting these data and identified any omissions in the total costs reported or estimated for the future.

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<sup>35</sup>This date represents the most-current data available.

<sup>36</sup>See DOD 7000.14-R, *Financial Management Regulation* (December 2011), and Department of Defense Manual 4715.20, *Defense Environmental Restoration Program (DERP) Management* (Mar. 9, 2012).

To determine the extent to which DOD has made progress in transferring excess property, we collected and analyzed data from the Office of Economic Adjustment as of September 30, 2015,<sup>37</sup> and interviewed officials with knowledge of these data to gather information to assess the reliability of the data. We found these data to be sufficiently reliable for our purposes. To identify any processes or procedures that DOD and the services have implemented to expedite the cleanup and transfer process and challenges that continue to hamper progress, we interviewed officials from the Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health and the three military departments. In addition, we selected seven sites at which to interview installation officials responsible for the caretaking and cleanup of the installations as well as representatives from the local redevelopment authorities. Our site selection was based on three criteria: (1) a mix of installations that were closed under legacy BRAC rounds and installations closed under BRAC 2005, (2) installations from among those with the highest environmental cleanup costs, and (3) installations that represented all three of the military departments. We visited four legacy BRAC round closures: McClellan Air Force Base, California; Mather Air Force Base, California; Fort Ord, California; and Treasure Island Naval Station Hunters Point Annex, California; and three 2005 BRAC round closures: Fort Monmouth, New Jersey; Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania; and Brooks City-Base, Texas. We also observed sites at the BRAC installations we visited to determine the status of DOD's cleanup efforts and the transfer of properties. To provide further insight into cleanup and transfer issues, we also conducted phone interviews with representatives from additional local redevelopment authorities, also selected based on environmental cleanup costs and service and geographical representation. In these site visits and telephone interviews, we also discussed the extent to which installation officials shared lessons learned with other installation officials. We reviewed this information in light of DOD's and the Office of Management and Budget's guidance on lessons learned as well as our *Standards for Internal Control in the Federal Government*.<sup>38</sup>

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<sup>37</sup>This date represents the most-current data available.

<sup>38</sup>Chairman of the Joint Chiefs of Staff Manual 3150.25A, *Joint Lessons Learned Program* (Sept. 12, 2014); Office of Management and Budget Circular No. A-11, *Preparation, Submission, and Execution of the Budget* (2015); GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

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During our review, we interviewed the following offices involved with the management and implementation of the environmental cleanup and transfer of property for BRAC installations:

**Assistant Secretary of Defense (Energy, Installations, and Environment)**

- Office of the Deputy Assistant Secretary of Defense for Environment, Safety, and Occupational Health, Arlington, Virginia.
- Office of Economic Adjustment, Arlington, Virginia

**Army**

- Army Office of the Assistant Chief of Staff of Installation Management, BRAC Division, Arlington, Virginia
- Former Fort Ord, California
- Former Fort Monmouth, New Jersey

**Navy**

- Navy BRAC Program Management Office, Arlington, Virginia
- Former Treasure Island Naval Station Hunters Point, California
- Former Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania

**Air Force**

- Office of the Assistant Secretary of the Air Force (Installations, Environment & Energy), Air Force BRAC Management Office, Arlington, Virginia
- Air Force Civil Engineering Center, Lackland Air Force Base, Texas
- Former McClellan Air Force Base, California
- Former Mather Air Force Base, California
- Former Brooks City-Base, Texas

**Local Redevelopment Authorities**

- Alameda, California (Former Alameda Naval Air Station, California)
- Brooks Development Authority, San Antonio, Texas (Former Brooks City-Base, Texas)
- Concord, California (Former Concord Naval Weapons Station, California)
- Fort Ord Reuse Authority, Monterey, California (Former Fort Ord, California)
- Fort McClellan Authority, Anniston, Alabama (Former Fort McClellan, Alabama)



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- Fort Monmouth Economic Revitalization Authority, Oceanport, New Jersey (Former Fort Monmouth, New Jersey)
  - Fort Monroe Authority, Hampton, Virginia (Former Fort Monroe, Virginia)
  - Horsham Land Redevelopment Authority, Philadelphia, Pennsylvania (Former Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania)
  - Office of Community Investment and Infrastructure, San Francisco, California (Former Treasure Island Hunters Point, California)
  - Sacramento County, California (Former McClellan Air Force Base and former Mather Air Force Base)
  - Seneca County Industrial Development Agency, Waterloo, New York (Former Seneca Army Depot, New York)
  - Vallejo, California (Former Mare Island Naval Shipyard, California)

We conducted this performance audit from January 2016 to January 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: Comments from the Department of Defense



ENERGY,  
INSTALLATIONS,  
AND ENVIRONMENT

## OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

3400 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3400

JAN 09 2017

Mr. Brian J. Lepore  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Lepore:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-17-151, "MILITARY BASE REALIGNMENTS AND CLOSURES: DoD Has Improved Environmental Cleanup Reporting, but Should Obtain and Share More Information," dated November 30, 2016 (GAO Code 100577).

In general, the report summarizes the status of DoD's progress in capturing and reporting environmental cleanup costs at installations closed under Base Realignment and Closure and transferring excess property. I have enclosed DoD's response to the GAO's recommendations.

Sincerely,

A blue ink signature of Peter Potofehney is written over the name.

Peter Potofehney  
Principal Deputy Assistant Secretary of Defense  
(Energy, Installations, and Environment)  
Performing the Duties of the Assistant Secretary of Defense  
(Energy, Installations, and Environment)

Enclosure:  
As stated

GAO DRAFT REPORT DATED NOVEMBER 30, 2016  
GAO-17-151 (GAO CODE 100577)

**“MILITARY BASE REALIGNMENTS AND CLOSURES: DOD HAS IMPROVED  
ENVIRONMENTAL CLEANUP REPORTING, BUT SHOULD OBTAIN AND SHARE  
MORE INFORMATION”**

**DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION**

**RECOMMENDATION 1:** To provide Congress with better visibility over the costs for the environmental cleanup of properties from all BRAC rounds to inform future funding decisions, GAO recommends that the Secretary of Defense direct the secretaries of the military departments to include in future annual reports to Congress that environmental cleanup costs will increase due to the cleanup of perfluorinated compounds and other emerging contaminants, and to include best estimates of these costs as additional information becomes available.

**DoD RESPONSE:** Concur. DoD will note in future Defense Environmental Programs Annual Reports to Congress that environmental cleanup costs will increase due to the cleanup of emerging contaminants, such as perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). DoD will include this note in the Fiscal Year 2017 Defense Environmental Programs Annual Report to Congress. DoD will also incorporate a best estimate of these costs into our environmental cleanup costs, as additional information becomes available.

**RECOMMENDATION 2:** To help the services more effectively share information and address environmental cleanups and transfers, GAO recommends that the Secretary of Defense direct the secretaries of the military departments to create a repository or method to record and share lessons-learned about how various locations have successfully addressed cleanup challenges.

**DoD RESPONSE:** Concur. DoD will develop a process to record and share lessons learned about how various locations have successfully addressed cleanup challenges. This will be done in conjunction with the Fiscal Year 2017 Defense Environmental Programs Annual Report to Congress process.

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

Brian J. Lepore, (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Laura Durland (Assistant Director), Tracy Barnes, Leslie Bharadwaja, Tracy Burney, Michele Fejfar, Amie Lesser, and Richard Powelson made key contributions to this report.

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# Related GAO Products

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*Military Base Realignment and Closures: More Guidance and Information Needed to Take Advantage of Opportunities to Consolidate Training.* [GAO-16-45](#). Washington, D.C.: February 18, 2016.

*Military Base Realignment and Closures: Process for Reusing Property for Homeless Assistance Needs Improvements.* [GAO-15-274](#). Washington, D.C.: March 16, 2015.

*DOD Joint Bases: Implementation Challenges Demonstrate Need to Reevaluate the Program.* [GAO-14-577](#). Washington, D.C.: September 19, 2014.

*Defense Health Care Reform: Actions Needed to Help Realize Potential Cost Savings from Medical Education and Training.* [GAO-14-630](#). Washington, D.C.: July 31, 2014.

*Defense Infrastructure: Communities Need Additional Guidance and Information to Improve Their Ability to Adjust to DOD Installation Closure or Growth.* [GAO-13-436](#). Washington, D.C.: May 14, 2013.

*Military Bases: Opportunities Exist to Improve Future Base Realignment and Closure Rounds.* [GAO-13-149](#). Washington, D.C.: March 7, 2013.

*DOD Joint Bases: Management Improvements Needed to Achieve Greater Efficiencies.* [GAO-13-134](#). Washington, D.C.: November 15, 2012.

*Military Base Realignment and Closures: The National Geospatial-Intelligence Agency's Technology Center Construction Project.* [GAO-12-770R](#). Washington, D.C.: June 29, 2012.

*Military Base Realignment and Closures: Updated Costs and Savings Estimates from BRAC 2005.* [GAO-12-709R](#). Washington, D.C.: June 29, 2012.

*Defense Health Care: Applying Key Management Practices Should Help Achieve Efficiencies within the Military Health System.* [GAO-12-224](#). Washington, D.C.: April 12, 2012.

*Military Base Realignment and Closures: Key Factors Contributing to BRAC 2005 Results.* [GAO-12-513T](#). Washington, D.C.: March 8, 2012.

*Excess Facilities: DOD Needs More Complete Information and a Strategy to Guide Its Future Disposal Efforts.* [GAO-11-814](#). Washington, D.C.: September 19, 2011.

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*Military Base Realignment and Closures: Review of the Iowa and Milan Army Ammunition Plants.* [GAO-11-488R](#). Washington, D.C.: April 1, 2011.

*GAO's 2011 High-Risk Series: An Update.* [GAO-11-394T](#). Washington, D.C.: February 17, 2011.

*Defense Infrastructure: High-Level Federal Interagency Coordination Is Warranted to Address Transportation Needs beyond the Scope of the Defense Access Roads Program.* [GAO-11-165](#). Washington, D.C.: January 26, 2011.

*Military Base Realignment and Closures: DOD Is Taking Steps to Mitigate Challenges but Is Not Fully Reporting Some Additional Costs.* [GAO-10-725R](#). Washington, D.C.: July 21, 2010.

*Defense Infrastructure: Army Needs to Improve Its Facility Planning Systems to Better Support Installations Experiencing Significant Growth.* [GAO-10-602](#). Washington, D.C.: June 24, 2010.

*Military Base Realignment and Closures: Estimated Costs Have Increased While Savings Estimates Have Decreased Since Fiscal Year 2009.* [GAO-10-98R](#). Washington, D.C.: November 13, 2009.

*Military Base Realignment and Closures: Transportation Impact of Personnel Increases Will Be Significant, but Long-Term Costs Are Uncertain and Direct Federal Support Is Limited.* [GAO-09-750](#). Washington, D.C.: September 9, 2009.

*Military Base Realignment and Closures: DOD Needs to Update Savings Estimates and Continue to Address Challenges in Consolidating Supply-Related Functions at Depot Maintenance Locations.* [GAO-09-703](#). Washington, D.C.: July 9, 2009.

*Defense Infrastructure: DOD Needs to Periodically Review Support Standards and Costs at Joint Bases and Better Inform Congress of Facility Sustainment Funding Uses.* [GAO-09-336](#). Washington, D.C.: March 30, 2009.

*Military Base Realignment and Closures: DOD Faces Challenges in Implementing Recommendations on Time and Is Not Consistently Updating Savings Estimates.* [GAO-09-217](#). Washington, D.C.: January 30, 2009.

*Military Base Realignment and Closures: Army Is Developing Plans to Transfer Functions from Fort Monmouth, New Jersey, to Aberdeen Proving Ground, Maryland, but Challenges Remain.* [GAO-08-1010R](#). Washington, D.C.: August 13, 2008.

*Defense Infrastructure: High-Level Leadership Needed to Help Communities Address Challenges Caused by DOD-Related Growth.* [GAO-08-665](#). Washington, D.C.: June 17, 2008.

*Defense Infrastructure: DOD Funding for Infrastructure and Road Improvements Surrounding Growth Installations.* [GAO-08-602R](#). Washington, D.C.: April 1, 2008.

*Military Base Realignment and Closures: Higher Costs and Lower Savings Projected for Implementing Two Key Supply-Related BRAC Recommendations.* [GAO-08-315](#). Washington, D.C.: March 5, 2008.

*Defense Infrastructure: Realignment of Air Force Special Operations Command Units to Cannon Air Force Base, New Mexico.* [GAO-08-244R](#). Washington, D.C.: January 18, 2008.

*Military Base Realignment and Closures: Estimated Costs Have Increased and Estimated Savings Have Decreased.* [GAO-08-341T](#). Washington, D.C.: December 12, 2007.

*Military Base Realignment and Closures: Cost Estimates Have Increased and Are Likely to Continue to Evolve.* [GAO-08-159](#). Washington, D.C.: December 11, 2007.

*Military Base Realignment and Closures: Impact of Terminating, Relocating, or Outsourcing the Services of the Armed Forces Institute of Pathology.* [GAO-08-20](#). Washington, D.C.: November 9, 2007.

*Military Base Realignment and Closures: Transfer of Supply, Storage, and Distribution Functions from Military Services to Defense Logistics Agency.* [GAO-08-121R](#). Washington, D.C.: October 26, 2007.

*Defense Infrastructure: Challenges Increase Risks for Providing Timely Infrastructure Support for Army Installations Expecting Substantial Personnel Growth.* [GAO-07-1007](#). Washington, D.C.: September 13, 2007.

*Military Base Realignment and Closures: Plan Needed to Monitor Challenges for Completing More Than 100 Armed Forces Reserve Centers.* [GAO-07-1040](#). Washington, D.C.: September 13, 2007.

---

*Military Base Realignment and Closures: Observations Related to the 2005 Round.* [GAO-07-1203R](#). Washington, D.C.: September 6, 2007.

*Military Base Closures: Projected Savings from Fleet Readiness Centers Likely Overstated and Actions Needed to Track Actual Savings and Overcome Certain Challenges.* [GAO-07-304](#). Washington, D.C.: June 29, 2007.

*Military Base Closures: Management Strategy Needed to Mitigate Challenges and Improve Communication to Help Ensure Timely Implementation of Air National Guard Recommendations.* [GAO-07-641](#). Washington, D.C.: May 16, 2007.

*Military Base Closures: Opportunities Exist to Improve Environmental Cleanup Cost Reporting and to Expedite Transfer of Unneeded Property.* [GAO-07-166](#). Washington, D.C.: January 30, 2007.

*Military Bases: Observations on DOD's 2005 Base Realignment and Closure Selection Process and Recommendations.* [GAO-05-905](#). Washington, D.C.: July 18, 2005.

*Military Bases: Analysis of DOD's 2005 Selection Process and Recommendations for Base Closures and Realignments.* [GAO-05-785](#). Washington, D.C.: July 1, 2005.

*Military Base Closures: Observations on Prior and Current BRAC Rounds.* [GAO-05-614](#). Washington, D.C.: May 3, 2005.

*Military Base Closures: Assessment of DOD's 2004 Report on the Need for a Base Realignment and Closure Round.* [GAO-04-760](#). Washington, D.C.: May 17, 2004.



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